

--Claims

What is claimed is:

Claims 1-15 (Canceled)

16(New). A system for allocating subcarriers to subscribers, comprising:

- A. a serial to parallel converter for the serial transmit data;
- B. a subcarrier modulation unit connected to said converter;
- C. a subcarriers allocation controller connected to the modulation unit;
- D. a multicarrier modulation unit; and
- E. a parallel to serial converter, which generates the transmit data out (serial), wherein the subcarriers allocation controller allocates subcarriers using a Reed-Solomon (R-S) codes scheme, and wherein the subcarriers allocation controller allocates subcarriers using a shifted version of a Reed-Solomon (R-S) code that are separated by more than one step difference.

17(New). The system for allocating subcarriers to subscribers according to claim 16, wherein the system is a cellular communication system.

18(New). The system for allocating subcarriers to subscribers according to claim 16, wherein the system is a xDSL communication system.

19(New). The system for allocating subcarriers to subscribers according to claim 16, wherein a group of 22 carriers is allocated to one user, another user will be allocated a cycled version of the group.

20(New). In a multicarrier system, a method for allocating subcarriers to subscribers, comprising the steps of:

- A. keep a table of R-S codes for frequency group allocation to base stations;
- B. assign one set of subcarriers based on R-S codes to a base station;
- C. assign other sets of subcarriers based on R-S codes to other base stations in such a way that adjacent base stations have different R-S codes, to minimize the number of collision points therebetween, further including the steps of:

- D. where a base station has sectored coverage, a plurality of codes are assigned to that station for use with the various sectors;
- E. base station keeps a table of available codes, wherein part of the codes are tagged "free" whereas the others are "in use" ;
- F. when a new subscriber gains access through a base station, the subscriber is assigned one or more of the codes for that cell;
- G. when a subscriber leaves the cell, his R-S code is tagged as "free";
- H. a new subscriber is assigned a shifted version of the code;
- I. different codes are allocated in various sectors, and taking into account the code of the nearby cell.

21(New). The method for allocating subcarriers to subscribers according to claim 20, further including the step of allocating several codes to each station for near/far subscribers, and separating far/near subscribers using different codes.

22(New). The method for allocating subcarriers to subscribers according to claim 20, further including the step of allocating several codes to each of several adjacent users within one cell, to decrease the interference resulting from Doppler, phase noise or collisions with other subscribers.

23(New). The method for allocating subcarriers to subscribers according to claim 20, wherein the code includes the subcarriers numbered:

0, 5, 2, 10, 4, 20, 8, 17, 16, 11, 9, 22, 18, 21, 13, 19, 3, 15, 6.

24(New). The method for allocating subcarriers to subscribers according to claim 20, wherein the multicarrier system is a cellular communication system.

25(New). The method for allocating subcarriers to subscribers according to claim 20, wherein the multicarrier system is a xDSL communication system.

26(New). The method for allocating subcarriers to subscribers according to claim 20, wherein a group of 22 carriers is allocated to one user, another user will be allocated a cycled version of the group.--